



L.D Technology
4000 Ponce de Leon
Suite 470
Coral Gables
FL 33146 USA
Tel: 1 305 777 0336

Email: sales.ldteck@gmail.com
www.ldteck.com

The Electro Interstitial Scanner E.I.S.

MODELING OF THE HUMAN BODY USING THE EIS SYSTEM

Overview of The EIS Modelling

6 electrodes are used with The EIS System and a current is passed from 1 electrode to another.

This current passes through various organs in the body and we refer to this as a volume. A total of 22 different volumes are measured with The EIS System. Once these volumes are measured we use mathematical calculations to determine the inverse problem which essentially helps us to deduce the missing data.

Human body, electrical activity and modeling of the human body

The human body has measurable electrical activity using cutaneous electrodes utilizing the principle of bio electric impedance. The direct problem is simulating the generated electrical potential starting from a power source. (30) (31) (32)

The modeling principle of The EIS System will be the result of the mathematical algorithms derived from the direct and inverse problems (64)

Mathematical formula used for the direct methods: Maxwell's Equations

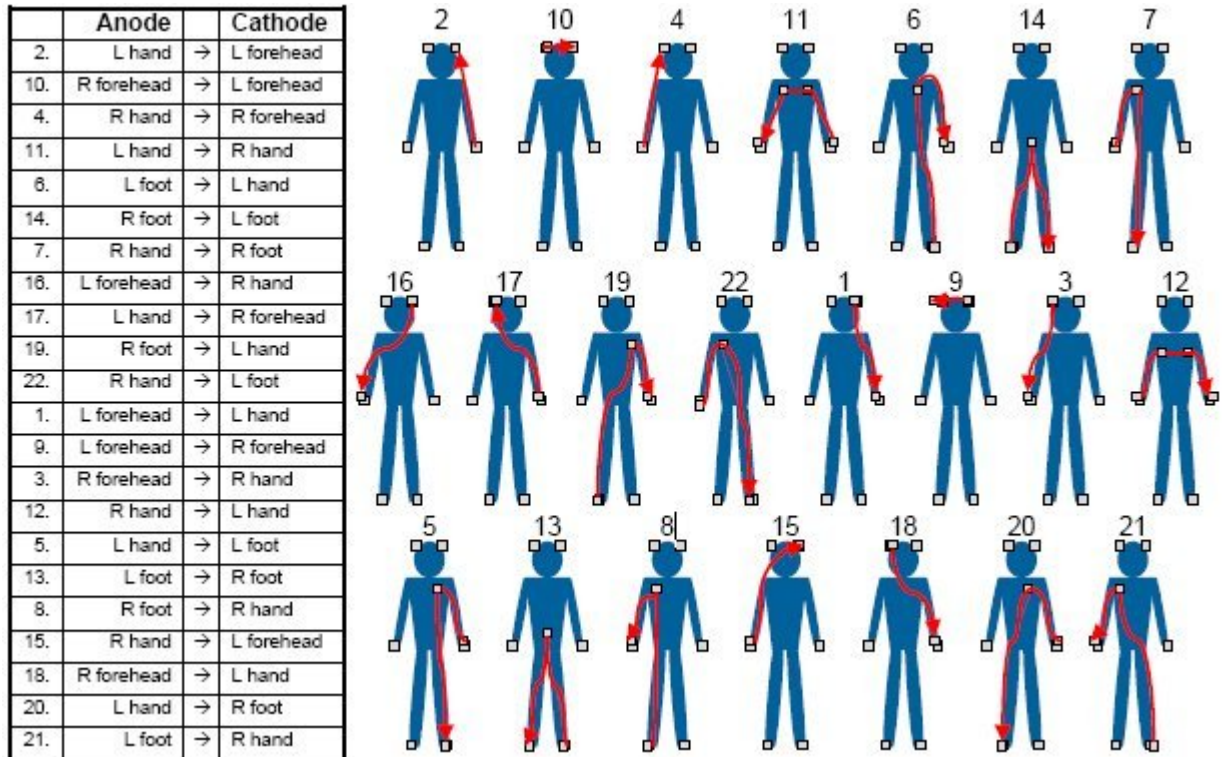
The standard Maxwell's equation was used as the starting point. Maxwells equation is considered the base starting point for most electromagnetism mathematical problems.

$$\epsilon_0 \approx 8.85 \cdot 10^{-12} Fm^{-1} \qquad \nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$

E and ρ represent the electric field respectively

Direct problems of The EIS System

The figure below represents the 22 volumes and the sequences of the respective recordings.



Volumes and body system: Direct evaluation

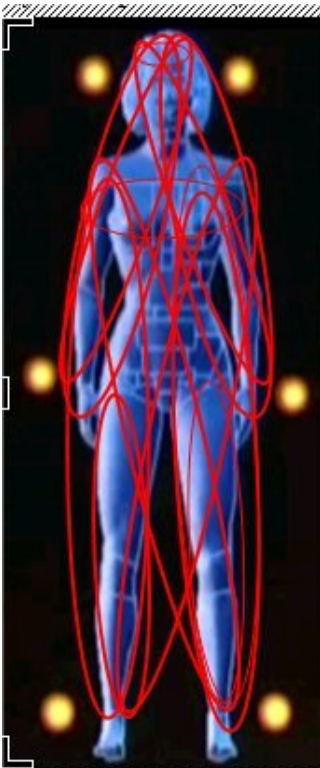
When we measure the 22 volumes the following volumes refer to the respective body systems.

- Neurological system: Volumes 1 2 3 4 9 10 15 16 17 18
- Cardiovascular system: Volume 6 13 19
- Digestive system: 5 6 7 8 19 20 21 22
- Uro genital and Renal system: 13 14
- Respiratory system: 11 12

At first the localization of the organs using the direct problem was achieved in using the application of the mathematical calculation of the Venn diagram principles. However, this area of localization of the various organs is not accurate enough since several organs may be included in the same area.



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The accuracy of the localization of the different organs requires the application of the inverse problems

Method for the inverses problem:

The mathematical algorithms of the “inverse problems” based upon the following principle:

“Each phenomenon is governed by equations with parameters like the initial conditions or various coefficients; when some of these parameters are unknown, we are within the framework of the inverse problems and to find them using experimental measurements amounts to solving the problem.”



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Inverse problem with The EIS System

With the aid of the ESG graph (see below) as a reference and criterion of judgment, in order to establish algorithms of inverse problems of localization, different clinical trials were undertaken. (See clinical tests)

For the inverse problem with The EIS System please refer to the following clinical trials:

[Clinical investigation Botkin Hospital 2003](#)

L.D. Technology LLC
4000 Ponce de Leon Blvd
Suite 470
Coral Gables FL 33146 USA
Phone : Toll free 866 516 01 90 / 305 777 0336
Fax : 305 777 0449
Email: info@ldteck.com

About LD Teck

LD Technology, the leader in bio sensor technology is a private US based LLC consisting of MD's, physicists, mathematicians, statisticians and data processing engineers with the goal of developing the Electointerstitial Scanner EIS System.

About The EIS System

The Electro Interstitial Scanner is a non invasive procedure which measures the interstitial fluid in the body with an 89% Sensitivity and 84% Specificity allowing for a functional body analysis within 2 minutes.